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**INDUSTRIAL EDUCATION
IN THE ELEMENTARY
SCHOOL**

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AUTHOR'S NOTE

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P. R. C.

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EDITOR'S INTRODUCTION

THE history of the teaching of manual training is one of the most interesting chapters in the evolution of the elementary school. Manual work was introduced into the curriculum at the beginning of the present period of educational unrest; and, because it had no fixed traditions to hamper its progress, responded most fully to modern educational principles.

When manual training was inaugurated in our schools, the public supposed it was to serve a practical industrial purpose; but the laity had not reckoned with the schoolmaster and school tradition. The teacher proceeded to make manual work a mental discipline rather than a practical utility, — a fallacious distinction long held by his craft. The new study was made into a set of formal exercises, rather than a group of interesting problems. The chief emphasis was laid on the practice of technique. The need of the child to express himself in manual activities that fulfill his desires was completely subordinated if not overlooked. What was worse, — the techniques

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were studied in isolation, that is, apart from the personal or social situations which call for their use.

Thus, in the earliest days of this movement, the pupil was taught to make a half-dozen different kinds of saw cuts. The purpose was not to construct anything with the pieces thus sawed; but merely to get technical efficiency. The exercises were not graded so as to give the child power to build some simple, useful object, in which the skills learned might be employed. They were ordered so as to constitute a series of complicated technical skills, the uses of which even the teacher did not always foresee. The training given had little relation to the child's need to understand, solve, and express his own experiences and needs through the use of the hands.

Any one who had heard children rendering scales and other vocal exercises in the music period, or seen children studying diacritics and phonetics in the reading class, or watched them dissecting sentences into clauses, phrases, and parts of speech in language instruction, can readily understand what had happened to the new study of manual training. It had fallen a victim to pedagogical formalism. The subject had been wrenched out of all relation to the

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child's imperious constructive instincts; just as school music had been divorced from the child's spontaneous desire to sing, and as school reading and composition had been isolated from the eager wish of the child to acquire new and appealing experiences through print and to express them by the written word.

For a time it seemed as though the introduction of manual training had contributed nothing to the school save an additional expense. It was as subservient to traditional pedagogical standards as any of the older subjects. But its rescue was easier, because its failure was more dramatic.

Teachers could not fail to observe the instinctive eagerness with which children always make their first entry into the manual training shop; no more could they fail to note that inevitable flagging of interest which characterized successive days of work at the formal exercises of the workbench. Somehow discipline was harder to maintain in the shop than in the other classrooms; yet these same children would coöperate in building kites and sleds in the back yard at home with an absorption so complete that the interference of parent or neighbor was seldom needed. Something was radically wrong with manual work at school. The teacher noted the fact.

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Then ensued a struggle to keep manual work motivated. The children ceased to saw a bit of wood at six different angles just to show that they could do it. They began to make projects for which they had a real use, — a coat-hanger, a shelf, a box, a stool, or a table. At first the instructor selected the task and set the model; later each child chose a project for himself and made his own drawings. Meanwhile all the technical requirements were acquired incidentally, and acquired more effectively than before, because the relation of skill to ends was now apparent to the child himself. Interest in the shop was reawakened, and increased efficiency followed.

Under this reformed regimen it was natural that the child should master such facts as he needed with unusual readiness. In this respect, the manual training period offered a marked contrast to other school exercises. In consequence, the great value of action or expression as a mode of educative experience was soon established.

This recognition by the schoolmaster of the worth of "learning by doing" expressed itself in a number of ways. It was easy to see that this primitive and therefore natural mode of learning would be most valuable with the youngest chil-

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dren. Thereupon, manual training was extended to the lower grades. The simple projects and skills of primitive peoples were utilized in the primary classes, — weaving, basketry, knife-work, and the like. This new sympathy of the elementary school with activity and occupations gave it common ground with the kindergarten, and additional types of constructive activity were borrowed, — building with blocks, paper folding and cutting, clay modeling. A differentiation of sex-needs added sewing and cooking. The range of manual work was greatly broadened with each of these successive extensions. Indeed, the field of manual work was now so much enriched that it became inchoate. The whole movement needed reinterpretation and reorganization.

The teacher's rediscovery of the principle of "learning by doing" profoundly influenced the whole curriculum. It changed elementary science into nature-study, where children actively participated in the control of nature instead of passively perceiving experiments demonstrated to them. It made the active social relations of children on the playground and in school thoroughly respectable resources for moral training. Organized play and self-government

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became methods of learning through self-expression. The principle of self-activity, which had been walled up among kindergartners, began to be quoted and applied by primary teachers. Dramatization and games became more important as modes of instruction in teaching beginners to read, and actually appeared within the stern precincts of the arithmetic period. Even language teaching relaxed enough to permit children to learn to speak and write through expressing their own thoughts and feelings. Grammar, too, came to be mastered through use. And song, long silenced by the demand to sing scales, emerged in rote singing. Learning through self-expression or action, a method first exemplified in a large, concrete way by manual training, came to be utilized in many school subjects, thus greatly reinforcing its worth as a mode of teaching and learning.

This projection of manual training into the center of educational debate greatly modified the point of view and the resources of those specially charged with its teaching. They returned from discussion to teaching with a disposition to reorganize their own work. They were now keenly alive to the enlarged purposes of manual training. They had lost much of the

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cultural narrowness which often makes the academic mind a matter of reproach. They saw in their instruction a large and important opportunity for giving the child an understanding of the economic organization which rests upon industry. Because elementary school children are young, they proceeded to develop an appreciation of industrial workmanship through the actual manipulation of materials in simple constructions, leaving information and interpretation of the more intellectual sort to be provided in a supplementary way as opportunity offers. Thus the great need to give all men some comprehension of the industrial processes and economic problems of American life begins to be amply met in the elementary school.

It is interesting to note how old oppositions are here reconciled. Active work with representative materials, — woods, metals, clays, fabrics, and foodstuffs, — supplemented by wider observations and readings, is adequate to develop that general industrial intelligence which every man ought to have. It is also broad enough to provide an adequate sampling for the child, destined by interest or necessity to make an early choice among trade schools and apprenticeships. This modern program provides an exceptionally

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appealing course for all elementary school children regardless of their future schooling or life. The importance of the social service it is devised to render makes an understanding of its essential principles desirable.

INDUSTRIAL EDUCATION IN THE ELEMENTARY SCHOOL

I

THE ANCIENT VIEW OF INDUSTRY AND INDUSTRIAL EDUCATION

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I. *Culture, education, and industry*

THE term "culture" implies the pursuit of objects regarded as good in themselves. The study of music is a branch of culture, because this study is thought to be an end in itself, not a means to something else. The same may be said of art and philosophy. Education is a broader term which includes every branch of mental development, so far as it is subjected to deliberate guidance. Education includes culture; but also includes a utilitarian element. On the surface, utilitarian education seems the direct opposite of culture. Such education is sought not for its own sake, like culture, but for the sake of something else. In the present discussion we are not concerned with the whole range of utilitarian

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education, but with industrial education only. To define the latter we must first define industry. Industry is the process by which natural products are made available for human uses. Industrial education, then, is the preparation of the mind for appreciating, understanding, and performing the transformation of natural objects into forms which are, according to human ideas, suitable for consumption or use.

2. Ancient prejudices survive in modern culture and education

The thinkers of the ancient world drew a rigid line between cultural and utilitarian education. They did not perceive that culture and utility might overlap. They could not see that although utilitarian education has an aim outside itself, it may also be worth while in itself. Their restricted view still persists both in the United States and in Europe, and constitutes more than half the prejudice against a recognition of the due place of industry in education. The Greek philosophers are chiefly responsible for this traditional contempt for industry. They convinced the Romans, persuaded the schoolmen, and dominated the Renaissance. Thus, in order that the traditional attitude of the schools toward indus-

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trial education may be understood, it is desirable that an investigation should be made into the various causes which contributed to prejudice the Greek mind against industry.

3. *The Greek prejudice against industry*

(a) *Aristocratic occupations glorified in culture.*

The principal business of a Greek aristocrat was war. We have the evidence of Herodotus that the honor of war among the Greeks contributed to the dishonor of trade and industry. "I have remarked," he writes, "that the Thracians, the Scythians, the Persians, the Lydians, and almost all the other barbarians hold the citizens who practice trades and their children in less repute than the rest, while they esteem as noble those who keep aloof from the handicrafts, and especially honor such as are given to war. These ideas prevail throughout the whole of Greece, particularly among the Lacedæmonians. Corinth is the place where the mechanics are least despised."

Doubtless Herodotus was right. Amid the arrogant conditions of militarism the soldier soon comes to despise the humbler if more useful pursuits of industry. The artisan who turns to a soldier's life, having once tasted the sweets of

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idleness, the pleasure of browbeating others, and perhaps the profit of the sack of cities, learns to look down upon the life of the workshop. As a soldier he stands in the relation of employer to employee, of patron to client, toward the armorer and other artisans; and he scorns to reverse this congenial status by resuming his' former lowly occupation. In the hour of victory he may have ransacked richer stores than as an artisan he ever contributed to maintain. From the fears of tradesmen he may have extorted money or goods beyond what he could have hoped to acquire in the course of months of honest toil. Thus the sword scorns tools, while tools resent the scorn of the sword.

After war, the chief interests of an Athenian gentleman were sport, music, politics, and literature, to which was added, after the time of Plato, philosophy. None of these subjects was utilitarian. Industry was not among the interests of the Greek aristocracy. It is probable that the philosophic conception of culture was deeply if unconsciously affected by the actual pursuits of the upper classes.

(b) *The status of industry as affected by slavery.* Again, the institution of slavery could not but affect the status of industry in the ancient world.

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Slavery has always made industry of certain kinds appear degrading. The ancients, however, justified slavery on psychological grounds. Aristotle maintained that some are slaves by nature. In taking this view, moreover, he was not enunciating an independent principle, but a corollary of Plato's division of the appetites from the reason. According to Plato, the reason should rule over the appetites; but as a matter of fact the mental nature of some is dominated by appetite or desire, while in others reason rules. Consequently the latter should organize and direct the lives and activities of the former. Those in whom the reason predominates should rule. Those who are swayed by appetite should be ruled, should in fact be slaves. Further, argues Aristotle, since in the world of nature as of art the inferior always exists for the sake of the superior, the slave exists entirely for the sake of his master. Yet, since no mind is wholly constituted of desires, Aristotle, perhaps, should only have concluded that some should be more servile, some more free. He scarcely had the right to argue that some are entitled to no freedom at all. In fact, however, the principle that some men are totally another's was frankly and ferociously adopted in Sparta, where the life of the slave was one of indescrib-

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able danger and misery. In the Roman Empire, too, slavery became an expansive festering sore within the body politic, sapping and destroying the estate of both yeoman and laborer, involving the land in servile wars and falling into line with other forces detrimental to the spirit of individuality. In Roman law the only legal form provided for questioning the slave was by torture. Favors might fall to the lot of the slave; rights he had none. Under these circumstances it was impossible that industrial pursuits, carried on as they were chiefly by slaves, should escape the servile stigma. Social status always affects work as well as worker. The contamination of industry was sure and unavoidable.

(c) *The thinkers, poets, and historians aristocratic.* Further, industry suffered in the estimation of the Greeks from the fact that it was not extolled like other activities by the poets whose works were a household word throughout Hellas. Most of the early poets, like Homer, wrote or sang for the royal courts; and almost necessarily expressed aristocratic sentiments in their songs. They had, therefore, no need of praise for the deeds of the common people. Commoners are never mentioned by name in Homer. While Hesiod stands on a lonely height in sounding the

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praises of the simple life of rural labor, he never attempts to dignify the life of the urban artisan. Nor were the historians more enlightened in this respect. Herodotus, Xenophon, and Thucydides were men of high social degree who could not entirely escape from the prejudices natural to their station. The same may be said of the philosophers. Drawn from the more leisured class, they naturally shared its views of life. The two great minds, those of Plato and Aristotle, adopted a psychological theory prejudicial to industry, the outlines of which have been indicated in the section on slavery. In his book on education, in the *Politics*, Aristotle hurries over the more utilitarian subjects, reading, arithmetic, drawing, and even gymnastics, in order to devote his chief attention to music, which alone has no use outside itself. Music was a costly and aristocratic study, the principal test of the education of an Athenian gentleman. An uneducated person was described not as illiterate, but as one who could not play the lyre. This meant that education and aristocracy coincided.

What is the main conclusion to be drawn from our survey of the ancient view of industry? In general, it is that the Greeks, from whom our own opinions are to a considerable extent derived,

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based their conception of the place of industry in life upon a dubious psychological and ethical analysis, reinforced by a certain bent of mind native and hereditary in them. This would not be of great importance were it not that the opinions of the Greeks have never been rejected by the main current of Western thought. For many centuries the Hellenic preference for cultural rather than industrial effort has been taken as final.

4. *The historic descent of Greek prejudice*

(a) *Rome.* The Romans under the Empire, cursed with the institution of slavery, and essentially aristocratic in their views, fell easy victims to the Greek ideas, which entirely separated industry from culture. Under the Republic, indeed, the Romans had gloried in their husbandry; but this was before the time of advanced education in Rome. The typical attitude of the Græco-Roman period is expressed by Cicero, who in his treatise on "Duties" distinctly refuses a place to industry in the vocation of a Roman gentleman. The Roman proletariat was indifferent; he lived for neither culture nor industry, but only for bread and the circus.

(b) *The Middle Ages.* During the Middle Ages,

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religion was the chief concern of the intellectual life. The Christian religion has so much to say for the worker that it might have led to his education as a worker. The fact that it did not was due largely to the emphasis placed upon another, an eternal, life. The world and all its works were regarded as temporary and comparatively unimportant. Even the Benedictine monks, who generally gave part of their time to manual work, did so mainly as a discipline. They had little or no desire to exalt industry. Industrial education stood far apart from culture, the one a matter of apprenticeship, the other a matter of books. The villein's son who learned to read escaped from villeinage into the Church. The industrial life knew him no more.

(c) *Scholasticism*. Nor was the scholastic system which preceded the Renaissance more favorable to the progress of industrial education. It was one thing or the other; one might either be a Latinist, logician, and theologian, or a son of industry. One could not be both. The former was considered a scholar, the latter an ignoramus.

(d) *The Renaissance*. During the Renaissance, the eyes of scholars were dazzled by the glory of the ancient literatures. Humanism, or the study

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of the classics, was the dominant note in education. Even those who rebelled against a system of mere imitation of Cicero remained enthralled to books. Bookishness is the hereditary foe of the industrial life; it removes men's eyes from the world about them and concentrates their attention upon the ideas of the past. The educated man henceforth was the classicist, who had neither time nor inclination for industrial interests.

(e) *The Reformation*. The Reformation might have made a difference in favor of industrial education had not the reformers been obliged to educate leaders. Their main need was of clergy and scholars to defend their theological positions. Consequently, although Luther, Calvin, and others were not blind to the needs of the masses, they concentrated their efforts upon the secondary or Latin schools. Thus in practice the Reformation, except in the field of religious instruction, made little difference to the course of studies which had been determined by the Renaissance.

(f) *England*. In England, moreover, as far as the schools were concerned, the Reformation and the Renaissance coalesced. Both movements were regulated by Henry VIII and his royal

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successors. As the classical education provided by the Latin schools was necessarily limited to the leisured class, or to those who made their way by scholarships or otherwise into that class, the ancient contempt for industry continued to be transmitted from one generation to another. In England, until the recognition of higher elementary schools by the Board of Education in 1900, there was practically no attempt to combine industrial with general education. Up to the nineteenth century, in fact, primary education was dominated by the idea of charity. The pupils were educated to be employees. They were expected to continue in their station of life. Reading, writing, arithmetic, and the catechism formed their course of study. Culture was the exclusive possession of the upper classes, and had nothing to do with utility. Cultural exclusiveness, indeed, is still a feature of the so-called great public schools. It was from England chiefly that the United States inherited its prejudice against industrial education in the schools.

(g) *The United States.* Part of the inheritance of the United States from the Old World was the sharp distinction between culture and industry. Culture, the result of a liberal education, was the mark of a gentleman. What had a gentleman to

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do with industrial efficiency? It is true that from the first the conception of culture was modified by the fact that a gentleman had estates from which he profited. The work of conducting an estate, however, has always been regarded as compatible with aristocratic tastes. Aristocracy is at all times closely associated with the ownership of land. Besides, a landed proprietor did not actually engage in manual operations. The colonial grammar schools, in which gentlemen were taught, therefore confined themselves to cultural studies, and chiefly to the classics. A broader view characterized the academies of the eighteenth century, but they had nothing to do with industry. The universities long resisted the introduction of industrial departments. Many of the universities, indeed, still give ground very slowly before the advance of industry. With some exceptions, old and endowed institutions adhere as long as possible, rightly or wrongly, to the traditions of the past. Industrial pursuits were poorly represented in the universities until after the Morrill Act of 1862, by which the States received generous grants of land for the support of agricultural and mechanical instruction. Manual work did not come into its own in the public high schools until about 1880, and then

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only under the guise of a general or liberal discipline. Its connection with industry was deliberately minimized. Trade schools, dating from 1881, involved no sacrifice of aristocratic prejudices, as they stood entirely apart from general instruction. Preparatory schools, and especially part-time and coöperative schools, have done a little, by bringing some elements of general instruction within the scope of industrial education, toward the establishment of the claims of industry to a place in a liberal education. Technical schools have little bearing on this problem. The public primary schools now give indirect attention to industry. They have not yet advanced to the point of giving the subject its own column in the program of studies. Except in a few centers, manual training is only incidentally industrial. In general, the situation in the United States is that the aristocratic prejudice is still in the field, although gradually yielding to the assault of democratic principles.

II

THE MODERN VIEW

1. *Falsity of the traditional theory under modern conditions*

(a) *As undemocratic.* From a modern standpoint, the traditional theory of industry fails in two respects, (1) as undemocratic, (2) as inadequate. According to the view which found its first philosophic expression in Greece, the business of the best minds is the pursuit of virtue, which was regarded as identical with culture. Only the leisured could devote themselves exclusively to this end. The masses were to support the classes in their cultural existence. Modern democracy rebels against this hypothesis. The democratic tradition has already won for the laborer a voice, sometimes even a controlling voice, in political government. It is making work of some kind obligatory upon almost every member of the community. It is living down the ancient contempt for the laborer, and investing work with a new respectability and dignity. Its

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underlying principle, the worth of man as man, is incompatible with a theory which excludes the majority of mankind from participation in the real ends of life. It insists that the things of real value in life shall be shared among all. Culture must be made universal.

(b) *As inadequate.* The traditional view of industry fails not only as undemocratic, but also as inadequate to the facts of modern life. In three respects the industrial conditions of to-day differ radically from those of earlier times: (1) industry is more ambitious than formerly; (2) it is more successful; (3) it is more scientific. So broad is the scale, so certain the results, and so ingenious the processes of modern industrial enterprise that it is now worthy of study for its own sake. Once industry was too simple to be worthy of intellectual steel. Now its management involves extreme mental development. The ablest intellects are no longer engaged in philosophy or art, but in industry.

2. *The new importance of industry in life, culture, and ideals*

(a) *A stimulus to culture.* The cultured man owes a debt to industry. Industrial efficiency is the condition of his culture. Progress in indus-

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trial operations liberates an ever-increasing proportion of the population from the work of primary production. But for industrial progress, so many men could not have been spared from tilling the ground to become teachers, writers, and clerks. Modern industry pays their salaries and provides them with leisure and books. Institutions as well as persons are indebted to industry. Schools and universities are endowed from its proceeds. This alone is a reason for the study of industry within their walls. In ordinary gratitude they should attempt to repay the debt by devoting a tithe of their attention to industrial concerns.

(b) *A condition of higher standards of living.* As a result of modern progress in industry, not only non-industrial workers, but even those who remain in the ranks of industry are furnished with rarer luxuries than were formerly accessible even to the few. The laborer has his piano, the servant her silk dress. The worker lives in a more comfortable if less pretentious dwelling than that of a nobleman in the Middle Ages. It is true that most of the Greek, Roman, and early Christian thinkers deprecated high standards of comfort. Plato pictured a simple city as the ideal, in which people would be satisfied with rude huts, beds of

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myrtle boughs, simple country fare, and plates of fig leaves. Juvenal satirized the pleasures of the Roman table; Tertullian inveighed against love of dress in women. The chief merit of industrial progress, indeed, is not that it raises the standard of material living, but that it provides new opportunities for the spiritual life. Hours of work are shortened to the advantage of both body and mind. The only hope of further advance in this direction is in future industrial development.

(c) *A source of ideals.* Modern industry is not only a stimulus to culture and a condition of higher standards of living, but also a source of ideals. Moral standards are developed in connection with industrial operations. Out of his industrial experience the worker has evolved the ideal of a unity of labor. The invention of automobiles suggests an ideal of duty to pedestrians. The construction of the Panama Canal brings into focus the ideal of healthy conditions of work. In such ways as these the moral life has been made richer and fuller by industry. Æsthetic ideals, too, are developed by the invention of new processes in pottery, dyeing, and other industries. Even the intellectual ideal, truth for truth's sake, is strengthened by conscientious and accurate workmanship. In industry a man learns to be

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true to himself. His work may deceive others, himself it cannot deceive.

3. *The status of industry as changed by historical factors*

(a) *The rise of a new psychology.* An epoch in the theory of industry is marked by the psychology of David Hume. According to Hume, reason is and must be the slave of the passions. This dictum reversed the doctrine of Plato and Aristotle, that reason should rule over the appetites. The Greek philosophers had held that the life of reason is the only life good in itself, and that its expressions are art, music, and philosophy. These accordingly constitute culture. Culture is rationality. Industry merely provides material goods for the satisfaction of the appetites. It is an irrational, uncultural pursuit. If Hume be right, however, the shoe is on the other foot. Appetite, and industry as the satisfaction of appetite, becomes the central element of human life. From this point of view reason is the servant, not the master. It is unnecessary to adopt this position. Kant showed how to overcome it. Rightly or wrongly, however, Hume's empiricism favored the growing dignity of industry, and called attention to the fact that the psychological

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argument of the Greek masters is not unanswerable. Reason and appetite are not so different as was formerly supposed. They are interdependent. There is no longer a psychological ground for the exclusion of industry from the scope of culture.

(b) *Modern religious interpretation.* The early Christian Church expected little but harm to come of luxury or riches. The good of the body seemed on the whole antithetical to the good of the soul. Bodily satisfactions were regarded as matters of indifference or as evils. This theory tended to diminish industrial achievement, and to exclude economic considerations from education. The modern tendency, however, is to dwell upon those elements in the primitive Church which reacted in favor of the development of material civilization. It is pointed out that the Apostles followed industrial callings, that the laborer is described as worthy of his hire, and that artisans are the equals of kings from the point of view of eternity. It is further argued that industry is not void of spiritual meaning, and that its development may be carried on in a religious spirit.

(c) *The growth of science.* Science seeks a theoretical mastery over nature; industry is content

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with practical victories. The growth of science, however, means the development of industry. The scientific attitude is experimental and inquisitive, and was formerly discouraged by the Church. Roger Bacon was only the most brilliant of a long line of investigators who suffered the ecclesiastical censure. The legendary sin of Faust consisted in his desire to know the unknowable, and to command the infinite. The modern tendency, however, is to develop an alliance between science and religion which cannot fail to benefit industry. The character of Sir Isaac Newton, at once scientific and pious, illustrates the possibilities of such an alliance. Science, by showing the operation of eternal laws within the universe, stimulates religious thought. By revealing the divine nature as essentially creative, it paves the way for the recognition of industry as sacred. From this point of view industry may be defined as the attempt of man to imitate the creative acts of the eternal mind.

(d) *The new humanism.* Another force which has tended to improve the status of industry is the movement known as "humanism." The essential feature of the movement is an emphasis upon human needs and interests. Humanism insists that the most direct and immediate concern of

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man is his present life. Upon the acts of the present life all future life is based. Man's work is not specious and temporary, but real and permanent. Men are not puppets, but in a literal sense masters of creation. The mastery of man over nature is real though incomplete. This point of view gives industry a new dignity. It is a serious attempt to better the conditions of human life. It is the tool with which man clears the road to his ideals. It is his effort to coöperate with divine purposes.

4. *Consequences of an obsolete conception of industry*

(a) *The antagonism of classes.* With all these forces ranged on her side, industry has not yet overcome the opposition of traditional prejudice. Obsolete conceptions of industry still abound; and one result is a world-wide strife of classes. The aristocratic and industrial classes still misunderstand one another. Those who, by birth, wealth, or talent, take their place in the upper strata of society tend to regard culture as their own monopoly. It is for them to pursue things worth while in themselves. The masses exist to support but not to share their culture. The provision of educational advantages for all has not

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radically changed the aristocratic attitude. There is still a great gulf between cultured and uncultured. The worker cannot find time to continue his education along so-called cultural lines. The gulf can be bridged in one way only, that is by making industry itself an integral part of the material of culture. When this is effected, the worker can obtain his culture in and through his work. The study of his own industry will make him a cultured man.

(b) *The ignorance of industrial operations.* Another result of the traditional prejudice against industry is that the so-called cultured classes know little or nothing about it. It would not be surprising to find a professor in arts who cannot tell what jute or terra-cotta is. It would be surprising to find one who knows how soap is made. Yet apart from tradition, the study of soap-making is as cultural as the study of grammar. When science fought its battle for admission into the curricula of the schools and universities, it had to be pointed out that a Greek particle has no cultural superiority over a chemical atom. The prevalent ignorance of industry among the educated is a serious matter. It deflects able minds from productive occupations. It alienates the sympathies of one class from another. It

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diminishes social efficiency. It must be combated by universal instruction in the fundamental industrial processes.

(c) *Separation of industrial from general education.* The traditional prejudice against industry is still strong enough to exclude the subject from a definite place in the school curriculum. The subjects of language, mathematics, geography, history, etc., are there, but not the subject of industry. Industry is treated in special departments of special institutions. Its broad outlines are not taught at all.

(d) *The need of industrial education in the elementary school.* The purpose of the elementary school is to give such knowledge, feeling, and power as all citizens should possess. As far as it neglects industry, the school falls short of its purpose. Industry is among the departments of civilization about which everybody should know something. Further, social sympathy should be cultivated in all citizens, and social sympathy cannot be developed until all the world knows what most of the people do. Social efficiency, too, depends upon knowledge, for without some acquaintance with industrial affairs even those who are engaged in other pursuits are handicapped. They cannot intelligently coöperate

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with work which they know nothing about. The modern view of industry, as a stimulus to culture, a condition of higher standards of living, and a source of ideals, implies that it should be no longer neglected even in part by the elementary school.

III

THE PRESENT PROBLEM OF INDUSTRIAL EDUCATION

I. *The distinction between industrial and vocational education*

INDUSTRIAL education is not the same thing as education for industrial productivity. The former is parallel to mathematical, geographical, or linguistic education. It is general, not technical. It includes those ideas, feelings, and volitions which all citizens ought to have concerning industrial operations and industrial life. It is as necessary for those who follow other occupations as for those engaged in industry. Consequently it falls within the scope of the elementary school. Vocational education, on the other hand, suggests preparation for specific callings. This is not the business of the elementary school, but of trade schools and other technical institutions. Elementary education should not become vocational, except in the broadest sense. In this sense all education is vocational, since all education tends to increase efficiency in all callings.

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2. *What the elementary school should do*

What the elementary school owes to industry is the study of man as a worker. This study is general, not technical. The subject is too broad for technical treatment. It is comparable to the study of language, history, or art. As the elementary school already focuses the attention of children upon man as a reader, writer, artist, traveler, mathematician, fighter, and ruler, so should it study him as a worker. Industry is the only great department of civilization, with the exception of religion, which is not studied as such in the elementary school. What, then, should be done? This: an investigation should be made of fundamental understandings, values, and skills as seen in industrial work, industrial life, and industrial institutions. This general statement may assist the teacher in selecting his material. The principle is constant, while the details vary. The exact field of investigation in any school will depend upon the nature of industrial operations in the neighborhood. Suppose that iron works, being near, are visited and studied. Children will notice the ores, machinery, molds, and processes used, the character of the output, the division of work, the skill of the workers,

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their relation to foreman, manager, and employer, the institutions connected with the works, and the conditions of labor. Children should be educated to take an intelligent interest in factories as well as in art galleries, museums, and libraries.

3. *The existing resources*

Industry has some allies on the program of the elementary school. As a subject of study, it has many points of contact with domestic art and science, manual work, commercial geography, and industrial history. Industry might be taught adequately under these heads. But it is not. A subject without a name may be well taught in the schools, but such a result is not to be expected. History might be taught as a part of civics, art, and literature, without being set down as history at all; but nobody is willing to take the chance. The same should be true of industry. Give industry its own place and name, and it will receive more attention than as an aspect of other subjects. It will still preserve an alliance with domestic art and science, manual work, history, and geography. It will not displace these subjects, although it may involve their reconstruction. It will have escaped from their leading-strings.

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(a) *Domestic art and science.* These subjects have a true relation to industry in two respects: (1) they are themselves industrial, since they involve the transformation of materials into forms adapted for human use; (2) they introduce students to a wide range of economic processes. The tendency is to emphasize the former rather than the latter relation. Food is prepared, but the catering industry is not studied. Attention is concentrated too much on individual items. The study of actual industries is neglected. The making of a handkerchief in class differs essentially from the industrial production of the handkerchief. The industry taught is and claims to be merely domestic. It is not the industry of practical life.

(b) *Manual work.* This subject also is industrial. Timber, metal, raffia, or other material is changed into serviceable form. Sometimes the aim is not use but discipline. In this case the industrial element disappears. Making a picture frame is industry; making a mortise and tenon joint is discipline. Manual work came late into the schools, but its evolution, accelerated by critical suggestions, has been remarkable. During the last twenty years it has passed through five stages, and the time is ripe for a sixth. It

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would not be just to say that each stage has been abandoned in turn for the next. Rather each stage has been absorbed into the next. The first stage was disciplinary, the object being the training of hand and eye. The second was utilitarian. Useful articles were made, the criterion being the interest of the pupil. The third was to a certain extent industrial. Objects were made to illustrate typical processes. For example, raffia-weaving was expected to typify the textile industries. The fourth stage was æsthetic. Manual work was treated as a phase of art, a form of self-expression. The aim was to cultivate the natural desire to express one's ideas in beautiful forms. The fifth stage was social. Manual occupations, such as sewing, weaving, or the construction of wooden models, were used as a center for instruction in other subjects. It is time that manual training entered upon a sixth stage, which may be called the "real-industrial," as opposed to the third, or "typical-industrial." It should be used to illustrate actual industries. The typical-industrial stage was marked by the construction of primitive or simplified forms of industrial apparatus. Such forms bear little resemblance to those in actual use. If the pupil is to understand industry practically and not

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academically, his manual work should differ in no essential particular from industrial production, except that the work should be conducted upon a more conscious and critical level.

(c) *Geography and history.* Commercial geography and industrial history have a precarious footing in the elementary school. Sometimes they are taught incidentally; sometimes not at all. History still concerns itself chiefly with politics and war. Even in geography, the commercial and especially the industrial references are generally subordinated to the physical aspect and location of countries and towns. Yet the converse scheme is feasible. This is how a sixth-grade teacher taught the subject: The geography came in only as it bore on the industrial side; that is, the climate, soil, rivers, etc., would only be incidentally touched on in connection with the growing of wheat, the raising of silkworms, or something else of an agricultural or industrial nature. The occupations in the immediate vicinity were most strongly emphasized. Among these was paper-making; and an excursion was made to a mill in order that the class might observe the whole process from the log to the paper. In this particular city there are many box factories, and another excursion was made

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to one of these. The growth of cities and its causes were given particular attention. In most cases the principal factor was found to be commercial or industrial. For example, Albany, New York, grew to be a fairly large city because of its situation on the Hudson, and was later augmented through the influence of the construction of the Erie Canal, which made it a go-between for the Great Lakes and the Atlantic Ocean. The forests of the State were compared with forests previously studied, and an examination was made of the different uses the trees were put to, and the objects into which the various woods were fashioned, such as flag-poles, pianocases, other articles of furniture, or small boats. The superiority of one kind of wood to another for a particular purpose was investigated, while the habit of making reference to the places where each variety of timber is found provided the necessary geographical unity. Should not this kind of teaching be extended with the aim of opening the minds of the young to the great possibilities of industrial activity, instead of centering them, as we do now, on unproductive occupations?

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4. *Experiments in industrial education*

(a) *In the kindergarten.* A number of teachers, taking advantage of the existing resources in the school curriculum, have experimented with industrial education. A beginning has been made in the kindergarten. Formal occupations like paper-folding begin to give place to industrial activities like basket-making. The conservative school, emphasizing play and imagination, looks askance at the industrial standard. The child in the kindergarten, it asserts, lives in the make-believe stage. His business is with symbols, not realities. The objection may be valid where the industrial work is unimaginative or inartistic, but not otherwise. There seems to be no reason why imaginative associations should not cluster as thickly about the making of a basket as about the laying of sticks in symbolic forms. If this be so, the rehabilitation of industry will affect the kindergarten.

(b) *In elementary manual work.* A number of attempts have been made to bring manual training into line with the real work of the nation. For example, one school in the South insists upon sewing from the girls, while the boys are allowed to choose between woodwork and printing. In

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this school there is also a brickyard; and the pupils make bricks and erect additional buildings for school purposes, often working throughout the summer vacation. A pupil-teacher planned the library building and superintended its erection by student labor only. It is remarked that in this school all the pupils are happy and the need of disciplinary measures never seems to arise. Other valuable experiments of the kind have been conducted at various centers. In one large city, manual training is now conducted on a most practical basis. Instead of accuracy and skill being made the object of the lesson, some practical article, from among several suggested by the instructor, is selected by the student and through his interest in the finished product the necessary discipline is acquired. The articles chosen may be things of use to the various members of the family or to the teacher, such as window-boxes, paper-weights, plant-stands, or book-shelves. Many of these objects are correlated with other studies. Above all, they are the result of a genuine industrial process.

In one school in which the formal elements of manual training are to some extent subordinated to the significance of the industrial product, the pupils of the elementary and secondary grades

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are required to spend at least one hour a day at shopwork under a competent instructor. The workshop is open every afternoon until six o'clock for those who may desire to spend additional time upon the piece of work they have in hand. Many of the pupils take advantage of this permission to pursue their industrial activities after school hours. A turbine water-wheel was made by the boys of the seventh grade after several days had been spent in the mathematical class in estimating the horse-power. Two boys, in their work after school hours, constructed a working locomotive, others a model of an automobile, others a steamboat. In the construction of these articles the character of the material and other considerations which affect the practical art of engine- and ship-building were taken into account. On one occasion the festival of Hiawatha was to be made the subject of a school celebration. The boys made the clubs and snowshoes, while the girls designed, carried out, and decorated the costumes. In all these cases the shopwork was removed from the level of mere hand and eye training to the more advantageous ground of preparation for industrial activities and appreciation of the industrial life.

(c) *In instruction.* Experiments have not been

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confined to manual training. Some teachers have attempted to give direct instruction in industry. Excursions have been made to factories in order that industrial processes may be studied in their own home. In this connection the evidence of a practical teacher may be quoted with advantage: "I am sure that there is nothing that will meet with quicker response from the children themselves. Nothing interests them more than the commonplace, everyday things about them. To me as a child, the manufacture of pins and needles, glass and bricks was a most fascinating subject for study. And later, I found that all youngsters had the same interest in penpoints and pencils, chalk and bullets. A few copies of *Industries* that I placed in our class library at school were soon in great demand. I am certain that there is not a child who will not sit up and listen entranced to the tale of the making of granddaddy's meerschaum or to the story of the construction of his mother's dishmop. Truly for them, there is nothing *old* under the sun."

5. *The need to expand our appreciations*

Industrial education is not a luxury, not a means of self-indulgence, still less a mode of perverting the natural emotions of the heart. On

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the contrary, it is a national necessity. Industrial operations suffer from nothing so much as the lack of intelligent men to carry them on. One hears that Germans, profiting by their eight years of industrial education, are taking the best positions in the commercial and industrial spheres, not only at home but abroad. Formerly the ablest minds were engaged in philosophy, literature, or some branch of activity regarded as cultural in itself; at present the ablest minds are engaged in industry. It is even regarded as desirable for the common good that a greater number of minds should turn from professional to industrial occupations. Who disapproves of the following changes of vocation? A young woman who was a mediocre teacher, having some ability in cooking, increased her knowledge and interest in the art by a course at a cooking school, and is now a popular caterer at society functions. Another young woman, who might have become a clerk or a typist, preferred to increase her knowledge of flowers by a course in horticulture, and is now the proprietor of a flourishing violet farm. A certain young man, instead of becoming an indifferent lawyer, interested himself in the subject of animal husbandry, studied it at college, and is at present a competent judge of live stock.

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Is it not probable that the community has benefited more from the efficient caterer, flower-grower, and stock expert than it would have done from the mediocre teacher, clerk, or lawyer? We need to expand our appreciations by making the study of industry universal.

The general problem may be illustrated by particular reference to the conditions which surround a certain public school in Brooklyn. In this school formal manual training and shopwork are prescribed for all boys after the third year, and cooking and sewing for all girls of similar grade. As might be expected, however, the manual and domestic training by no means serve to attract children to an industrial life, or even to prepare them for it. The boys become clerks or office-boys; the girls become unskilled hands in factories or serve behind the counters of department stores. These avenues of employment are consequently choked with applicants. It would certainly be desirable that the children should be given such ideas of skilled trades and more complicated industrial processes as might attract the energies of a number of them into more ambitious occupations. Very near the school the trades of carpenter, blacksmith, wheelwright, etc., are in operation, while neighboring factories

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carry on the making of clocks, tablets, maltine, shoes, and shirt-waists almost within sound of the school classrooms. Within walking distance the children may find shipping, railroad transportation, wood-yards, paints, electric power-houses, construction in concrete, and the varied activities of the building trade. The neglect of these opportunities for a practical yet highly intellectual education is either the result of a narrow educational outlook, or of a false view of the place and value of industry in human experience.

IV

THE NECESSARY RECONSTRUCTION OF THE SCHOOL CURRICULUM

1. *Review of the present place of industry in the curriculum*

(a) *The lack of industrial purpose.* Speaking exactly, one is compelled to admit that industry — in fact, the whole economic life — is seldom directly represented in an elementary school at all. The alliance of art, manual work, and other subjects with industry is potential rather than active. There are several radical defects in the scheme of art and manual work which remove these subjects from the category of genuine industrial education. In the first place, they are not real but theoretical occupations. In some cases they are taught merely for discipline. They neither create things that society really wants, nor use the methods of contemporary industry. Knowing the unreality of the work upon which he is engaged, the pupil drops it on leaving school never to touch it again. In the second place, the

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range of art and manual work in the schools is too narrow. Where work is done in wood, it is generally limited to certain lines of elementary cabinet-making. There is no reference to the other great wood industries. If there is work in clay, it is limited to modeling. One hears nothing of the great compressing industries, no word of brick or terra-cotta. Art-work in the schools seldom makes any pretense of industrial purpose. Pure art seems to be its aim, not artistic work. It seeks technical perfection rather than economic service. In short, neither manual work nor art develops industrial interests.

(b) *The disciplinary aim.* Even with the limitations described above, however, it cannot be denied that the manual activities of the schools have a natural relation to industry. Work in wood, for example, fulfills the definition of industry, since it transforms natural objects into ideal forms. The trouble is that the industrial elements in the school curriculum are so specialized that they do not represent industry at large. They are whittled down to a negligible quantity by the theory that regards education as little more than a process of discipline. By way of illustration, let us consider the content of a first year's course in woodwork. During the year, the pupil may

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learn to use certain tools, to plane a piece of wood truly, to square it on four sides, to construct a joint, and to make a picture frame embodying that joint. From a disciplinary point of view, this is enough work for one year. Technical perfection is exacted, good habits are formed, a social atmosphere is enjoyed, hand and eye are coördinated, and benefit is derived from the muscular exercise. These advantages may well be sufficient to justify the place of manual work in the schools. Our point is, they all belong to the field of general training and discipline. They do not include an insight into the nation's work. Industrial knowledge is unrepresented.

2. The need of a subject called "Industry"

Only one solution of the problem promises to be satisfactory. The curriculum of the elementary school must undergo a reconstruction. Industry must appear as a subject upon the program of studies. It must be given a local habitation and a name. This conclusion is logical, since the curriculum is supposed to represent all the fundamental branches of civilization. It is right, since industry has proved worthy of study. It is necessary, since only in this way can one be certain that industry is studied by all. It is a duty,

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since the very possibility of general education depends upon the industrial efficiency of the people. Let no one say that the curriculum is overcrowded. Industry can be taught with little or no addition to the burden. The end can be attained by a process of reorganization. Manual work may be included wholly or in part under industry. Woodwork for boys, sewing and cooking for girls, will be treated in connection with the study of timber, textile and food industries. In this way manual work will be transformed, but not necessarily increased. The industrial section of geography and history can also become part of the new subject. A slight curtailment of other subjects may become necessary in order to provide time for instruction about industries and for excursions to local factories. Time-tables differ so much that this problem must be left to the practical teacher or superintendent.

3. The significance of the new subject

The new subject will involve a change of content. Disciplinary occupations will be minimized. The pupil will engage in modeling industrial implements and making industrial products. The necessary discipline will be obtained by the way. A class of pupils may coöperate in con-

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structing a model of a mill, each pupil making a part. Pupils will learn about the great national industries with which their work is connected. They will visit local works. Far from being a change in name alone, the introduction of the subject of industry into the elementary school curriculum may be expected to modify the entire character of instruction throughout the institution. The proposed reform will make school work more practical, more independent of books, more interesting to the pupils, and more indispensable in the eyes of the community.

4. Conduct of the subject

The field of the teaching of industry in the elementary school may be divided into three parts, (1) instruction, (2) observation, and (3) manual action. Instruction will begin with the history and description of industries conducted near the school, and will extend to all the great national industries. It will thus include historical and geographical references. The maps of the district, of the State, and of the United States will be freely used in the study of this portion of the subject. Observation will involve excursions to farms, factories, or government works in the neighborhood. Manual work

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will be necessary in order to prepare for instruction and to fix its results, and will also serve to illustrate objects and implements that have been observed.

5. Relation to manual action

Believers in manual work may be inclined to resent the incorporation of that subject in another. Manual work has justified its place in the curriculum. It has exercised the bodies, trained the muscles, promoted the artistic taste, developed the originality, and attracted the interest of school pupils. True, and there must be no retrograde step. All these advantages will remain. Manual action to illustrate industrial processes will conserve them all, and add others. There is no going back. Not an hour need be taken from the time allotted to manual action. The pupil will not be less interested, but more, in modeling actual products and illustrating actual processes than he is in the more formal procedure of ordinary manual training. The subject of industry may even become the special property of the manual training teacher. In most schools, however, the class teacher will do the work. It will be stimulating, because teacher and pupil are genuine co-workers. It will be informative, for few

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teachers know much about industrial enterprise. It will be attractive, because human nature is fascinated by action. The demand on the manual workshop to illustrate industrial operations will probably come from the children themselves.

6. Relation to other subjects

In the elementary school, domestic art and science are usually represented by cooking and sewing. These and similar occupations are parts of manual work, and will be embodied in the new subject of industry. For girls, industrial instruction will center to a large extent about the foods and textiles, although there is nothing inappropriate in a study of the metals, clays, and woods. What is usually neglected in domestic art and science is the connection of the processes performed by pupils with actual industrial conditions. The very name of the new subject will tend to remedy this defect. Girls will not only learn to make cakes and pocket handkerchiefs; they will also learn to understand the industries of baking, catering, and clothing. Geography and history will either surrender their industrial aspects to the new subject, or else supplement it by a definite treatment of those aspects. Again, if design is not already included in draw-

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ing, it ought to be embodied in the subject of industry.

7. Relation to the theory of culture

How does the teaching of industry accord with the standard of culture? According to the traditional opinion, a study that is useful cannot also be cultural. Culture consists of philosophy, literature, and the fine arts. We have traced this view to its origin in aristocratic prejudice and an obsolete psychological analysis. We need a new theory of culture. The old definition may be retained, — culture is the study of things worth while in themselves. It is the content, not the form, of the definition that must be changed. Things worth while in themselves include all great matters, whether useful for external ends or not. The industrial life is a great matter. It lies at the root of all civilization. It calls for the highest mental powers. It enriches the moral life with opportunities for the exercise of the economic virtues. If culture is the study of great things, it can no longer exclude industry.

There are those who would define culture differently. Culture has nothing to do with content, they say, but is simply an attitude. If so, it consists in the habit of viewing things in a

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large-minded way. This is precisely the attitude necessary for the study of modern industry. Pettiness has no place; the larger issues must be faced, and the whole of human nature is involved. Thus, however defined, culture includes the study of industry.

8. *Relation to primitive industry*

How far the primitive development of industry may be expected to furnish a clue to the education of children is an open question. Granted, primitive man lives like a child in the moment; like a child he cares only for the present, having no thought for the future; like a child he is self-centered; and above all, like a child he has comparatively little control over the natural phenomena about him. It is not necessary to suppose that the stages of industry through which the race may have passed are normally recapitulated in an identical serial order in the life of each individual. Even if it be true that every civilized people has passed through the economic stages of hunting, fishing, pasturage, and agriculture, — no very reliable generalization, — it is idle to imagine that the interests of a boy are definitely connected by nature in turn with hunting, fishing, herding, and tilling the ground. This form

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of the theory of recapitulation is not to be taken seriously. Further, any form of the theory is open to the objection that nothing could be more different from the rigid customs of primitivism than the flexible manifestations of child nature. Children, however, are radically at one with primitive man in their lack of introspective and critical power, and in the absence of an adequate control over their environment, whether in the direction of stores, tools, methods, or elimination of waste.

In two respects the environments of the child and the savage are alike — they stimulate little thought and exact little foresight or control. Both the child and the savage as a rule live with little care, little foresight, and little industry. The environment of each is simple. Probably such similarities are sufficient to account for the large field over which the natural interests of children and those of primitive people appear to be identical. There is no need to exaggerate the influence of heredity, or to suppose, with the followers of the culture epoch theory, that the pursuits of the race have not only been proportionately registered in the instincts of human beings, but even reappear as instincts in their original order. It is enough that two simple environments may

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be expected to be more alike than two complex, or one complex and one simple; and merely for this reason a certain resemblance between the interests of children and those of primitive man appears to be fundamentally involved.

Because the respective environments are similar, then, the interests and occupations of primitive man furnish a clue to the interests and activities appropriate to the education of children. The curriculum itself, being dictated by the needs, the inheritance, and the interests of the present rather than by those of the past, need not be affected by primitive industrial conditions. In domestic art, children will not make primitive forms of headgear, but hats of the latest fashion; and if they should go to the length of constructing Indian baskets, it is chiefly because the baskets are as useful and beautiful when measured by modern standards as in their original social setting. It is not the course of study but the method of the elementary school that is likely to be advantaged by a knowledge of the conditions of primitive industry. No matter what primitive man did or needed to do in the distant past, the materials of a school curriculum cannot be rearranged in the light of his past activities. On the other hand, there is no corre-

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sponding objection to the modification of method, while it is not difficult to show that there is greater logical necessity for such a modification. Society cares little in what manner the child is to be put in possession of his inheritance as long as the end is reached. Moreover, the fact that a child lives in some respects like primitive man has little to do with the materials, but much with the processes, of his intelligence and interests. It follows that while there may be little gain in teaching children the things that primitive man has done, there may be much advantage in training them in the identical processes and methods by which humanity has been shaped and guided to its present condition.

V

THE NECESSARY RECONSTRUCTION OF SCHOOL METHOD

I. *Instruction*

LET us now consider how to teach the subject of industry. The typical methods will be instruction, observation, and action. At present teachers of manual work rely chiefly upon action. Observation of industries is seldom attempted; and instruction in the broad facts of industry is conspicuously absent. Too often the teacher fails to instruct where instruction is most appropriate; that is, in connection with action. Consequently the first method to be insisted upon in the subject of industry, which is to include part or the whole of manual training, is instruction. Pupils must be taught the meaning of industry, the scope and importance of industrial enterprise, the value of labor not only in terms of coin, but in terms of feeling. They must become so familiar with industrial arts, that their minds, not being strange to such subjects, will not recoil

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from the thought of economic employment. Manual action alone cannot bring this about; and even the observation of industries, unsupported by instruction, falls short of the mark. We must instruct; but this does not mean that the teacher is to din his words into the pupil's ears and imagine that every word goes home. We must instruct scientifically.

There is little need to describe an instruction lesson to teachers. We are all familiar with several forms of procedure. Let us suppose, however, that the month's work is to be upon the paper industry. A period from 10.30 to 11 A.M. on Mondays, together with a period from 2 to 4 P.M. on Tuesdays, may have been set apart for the subject. In general, the former period will be given to intellectual, the latter to manual work. The distinction is relative, not absolute, but for purposes of analysis it may serve. On the first Monday the teacher gives an introductory lesson. He instructs the pupils about paper-making, and perhaps even the distribution and use of the product. He begins by finding out what the pupils already know about the subject. Should he discover in his class the child of a worker in the trade, he will make use of the opportunity to augment his own knowledge and that of the class.

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The next step may be to show photographs of the works to be visited, or other illustrative material. The next will probably be a description of the industry by the teacher, with the aid of map, diagram, or other illustration. The next may be drill, concluding with note-taking.

2. Excursions

The afternoon of the following day is devoted to a visit to the paper mill. The whole process is observed; and the children, having learned what to look for, may be expected to see more than would be apparent to the casual visitor. The objection is raised that the factories may close their doors to the children. In a few cases this will be so; but there are many hospitable factories, and many manufacturers who realize that their works will benefit by the development of industrial interests and industrial knowledge. At least, let the difficulty arise before much is made of it. There are farms, bridges, and buildings as well as factories to be visited; state, national, and municipal works as well as private enterprises to be observed. Even when a program has to be provided for several classes, it is not easy to believe in the impossibility of arranging six or eight industrial excursions for each

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class during the year. The excursion is the key to the method of the subject. Its value has been tested, and it is not impracticable.

So central is the excursion in the scheme of industrial education that a practical illustration of its use may be helpful. A class of children, of the average age of only seven years, was taken to visit a great wool store. The children had talked about sheep, discussed pictures of them, sung songs about them, played games representing them, handled their wool, and had even drawn, modeled, and built such objects as sheep, sheds, shears, bales, and wagons. They had brought to school their own picture cards and scraps of colored wool; and had unraveled woollen garments to show the weaving. Their parents readily consented to the excursion and provided the necessary fares. The children walked in fours, the outside boy of each four being responsible for keeping his particular group up with the class. At crossings, the leaders waited for a signal from the teacher before advancing. Drivers of vehicles showed the children every consideration. Conductors and the public vied in assisting them to board and alight from cars. Arrived at their destination, the children gazed at great wagons laden with fleeces, bale after bale of which was

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being hoisted to the upper stories of the building. Having finished their task, the workmen entered into conversation with the children, whose hearts were completely won by the gift of fragments of wool. The building was entered, and the young visitors were shown by an assistant through the various rooms containing wool. Exclamations of surprise and pleasure broke from the children as they approached each article in the show room. Here were stuffed sheep with long, clean, well-combed wool. In the showcase was wool in all its stages, raw and dirty, washed and scoured, combed and wound in skeins. An animated discussion, to which the bystanders lent their ears with amusement and interest, took place as to the relative merits of the prize sheep shown in pictures on the wall. Mounting a steep flight of stairs, the children came upon bales of wool, not wired like the skins, but surrounded by canvas bagging, and hoisted by means of an open elevator. In the far corner were open bales; and many were the estimates of the number of sheep required to furnish the wool of one bale. On leaving, each received a piece of clean wool. Having thanked their entertainers, they wound up with cheers and returned to school.

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3. *Manual action*

After the excursion, the three remaining afternoons allotted to industry during the month are devoted to the construction of models or such objects as lend themselves to concrete representation. Thus three afternoons in the month are given to manual work. The models will be selected in accordance with what has been learned and seen. In general, different members of the class may be permitted to construct different objects. In some cases the coöperative plan, by which each child makes a part of a large model, is best. The parts are put together, and the model becomes the property of the school, to be used in future lessons, or to be preserved in the school museum. In other cases it will be possible for each child to make a useful article which he may keep; but the direct object of manual work will not be utility in this sense, but the illustration of genuine industrial operations.

One danger should be guarded against. Unless the teacher maintains high standards of execution, the disciplinary advantages of manual training may be unduly sacrificed. Manual work must continue to produce good habits. Care, accuracy, and neatness must still be cultivated.

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The work must be as carefully planned and as conscientiously executed as when discipline was regarded as the sole end of manual action. Mistakes must be corrected and the correct form practiced. The habit of skillful work is as possible of achievement under the new system as under the old.

4. *Oral expression*

The first morning period of the series has been allotted to preparatory instruction. The second, since it follows the excursion, may be given up to a discussion of what has been seen and learned. The views of the children are expressed, and a comparison is drawn between what they had expected and what they had actually found. The teacher's part is chiefly to regulate the expression of opinions, and to write upon the blackboard the contributions that are worthy of such notice. The period may close by note-taking, based upon what has been set on the board.

5. *Study*

In the third week, the morning period may be given up to a study of the larger aspects of industry. In the case cited, the children will study books or articles bearing upon the paper indus-

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try. They may be encouraged to bring such materials to school. Perhaps a textbook may be employed; perhaps a copy of a magazine may be purchased and used. The subject of industry is too vital to remain long without its textbook; indeed, there are books in existence that would be found of great service.

6. *Written expression*

The final morning period of the series will probably be given to written composition on the subject of the excursion or on the industry in general. The pupil has something to say, and the process of committing his ideas to paper is one of the best means of securing their permanence. It is unnecessary to discuss the methods appropriate to the teaching of written expression.

The method of conducting the subject of industry for one month may be summarized as follows: —

	<i>First week</i>	<i>Second week</i>	<i>Third week</i>	<i>Fourth week</i>
Monday 10.30 to 11. A.M.	Introductory lesson on paper-making	Oral discussion of the visit	Study of text- book or maga- zines	Written composition
Tuesday 2 to 4 P.M.	Excursion to paper mill	Construction of models and other illustra- tions	Construction of models and other illustra- tions	Construction of models and other illustrations

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The above scheme is suggestive only. The purpose of this book is not to dictate the details, but to expound the principles of elementary industrial education.

7. *Suggestions from primitive industry*

We have observed that society cares more for the course to be studied than for the methods to be used in the schools. Accordingly, while the curriculum must be measured by present standards, method may be influenced by other considerations. In the sphere of method, the teacher is warranted in accepting suggestions based on the correspondence between the interests of children and those of primitive mankind. In these pages, the term "primitive" is applied to tribal conditions in which civilization is reduced to its simplest elements. Primitive man lives in and for the moment. He is improvident, and is guided by instinct rather than reason. He is conservative in his customs. He prefers the decoration of his person and weapons to other forms of work. He is industrious only to acquire food. He thinks only under the pressure of novel circumstances; and, as a consequence, has little control over his surroundings. In most or all of these features there is a parallel to child life. As

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one would deal with primitive mankind, so, to the extent of the parallel, does one deal with children. The child, like the savage, prefers immediate to distant aims. When Governor Grey wished to get work done by Australian natives, he paid them sixpence in the middle of the day, and a shilling at the end. How like the method of encouraging children! For them, the teaching of industry should be related to current needs and interests. It is useless to tell a class that the day will come when they will appreciate it. Children seldom look forward so far. The teacher will illustrate his instruction by objects and processes which interest the children *now*. In fact the production of things which the child himself possesses, or desires to possess, is the ideal starting-point for the study of national industry. From this beginning, the field of vision may be expanded until a liberal knowledge has been gained of the whole industrial arena.

8. *The new features in school method*

It will be seen that the new methods demanded by the subject of industry are two: (1) the excursion to industrial centers, and (2) the free use of instruction in connection with manual activity. These methods, of course, are only relatively

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new; but they are not generally adopted in the elementary school. Usually the excursion is confined to the field of nature-study, and instruction in connection with manual work is confined to the task in hand. The result of the new methods should be a new familiarity with industrial arts and a new interest in industrial processes and products. The excursion will make school work more real and up-to-date. Instruction will widen its scope. The former method will develop interest, the latter knowledge; and the two will interact in such a way as to remove traditional ignorance, banish traditional prejudices, and reform traditional standards of culture.

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